



Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

## DEPARTMENT OF NATURAL RESOURCES

[www.dnr.mo.gov](http://www.dnr.mo.gov)

OCT 13 2015

Mr. Mike Jay  
U. S. Environmental Protection Agency  
11201 Renner Boulevard  
Lenexa, KS 66219

Dear Mr. Jay:

Thank you for submitting comments in regards to the 2015 Monitoring Network Plan which was made available for public inspection on our website on June 15, 2015. I would like to take the opportunity to address the comments you submitted. EPA's comments focus on the monitoring networks for the Ameren UE Labadie and Rush Island coal fired power plants.

Our responses follow your original comments identified in italics.

*"1) Lack of clarity in the plan regarding the purpose of monitoring location(s) around Labadie and Rush Island Energy Centers. EPA is unclear regarding the intended use of the data generated by the monitors at both Ameren energy center locations. For Labadie, Labadie is a Consent Decree source and as such modeling is required to establish a designation and boundaries. For Rush Island, Rush Island's attainment issues should have been addressed in the attainment plan that was due to EPA in April of 2015. EPA requests that MDNR clearly state what purpose the additional monitors, and data from the monitors will serve in the future."*

Page 14 of the 2015 Monitoring Network Plan describes the purpose of the Labadie Monitoring Network. Ambient air monitoring can be conducted to support other purposes, not just area designations, consistent with 40 CFR 58 Appendix D including: providing air pollution data to the general public in a timely manner, support compliance with ambient air quality standards and emissions strategy development, and support for air pollution research studies. As indicated in the 2015 Monitoring Network Plan, characterizing current air quality and meteorology near the Labadie Energy Center will provide quantifiable and useful quality assured technical information to supplement the ongoing 1-hour SO<sub>2</sub> NAAQS implementation process. This process will likely involve evaluating the quality assured ambient air monitoring data with source specific refined dispersion modeling and monitor how well each of these sources are controlling their pollutant emissions over time. This is one of the objectives cited in 40 CFR 58 Appendix D, 1.1(b). We intend to work with EPA staff as appropriate to address any applicable boundary recommendations and SIP attainment plans.

Mr. Mike Jay  
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*"2) Lack of technical data provided for EPA to analyze MDNR's support for the locations selected for monitoring"*


EPA comments in this section are related to modeling issues or modeling methodology. Dispersion modeling files are not required elements for inclusion in an Annual Monitoring Network Plan consistent with 40 CFR 58.10. Modeling methodology documents are not a required element of Annual Monitoring Network Plans nor required by EPA's SO<sub>2</sub> NAAQS Designations Source-Oriented Monitoring, Technical Assistance Document, nor required by the monitoring characterization approach in the proposed DRR.

As indicated in the plan, modeling was performed for the Labadie power station and dispersion pattern graphics for that modeling may be found in figure 2.2 of the plan and we do have modeling datasets that support the siting of the Labadie monitors. We supplied the Ameren UE's draft Quality Assurance Project Plan for the Labadie Sulfur Reduction Project to you by email on September 4, 2014. On July 29, 2015 we sent the Labadie modeling files to Mr. Andy Hawkins of EPA Region VII. The monitoring objectives and spatial scale of representativeness of the monitors is identified in the plan consistent with the requirements of 40 CFR 58.10.

Thank you again for your comments on this plan. If you have questions regarding this letter or need any additional information, please contact me at the Department's Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or by telephone at (573) 751-7840.

Sincerely,

AIR POLLUTION CONTROL PROGRAM



Kyra L. Moore  
Director

KLM:shd

c: Mr. Mark Hague, Acting Regional Administrator, U.S. EPA Region VII  
Mr. Larry Gonzalez, U.S. EPA Region VII  
Ms. Amy Bhesania, U.S. EPA Region VII  
Mr. Leland Grooms, U.S. EPA Region VII  
Mr. Michael Davis, U.S. EPA Region VII

SO<sub>2</sub> Monitoring  
→ plan  
→ Nash Univ comment  
→ MDNR Resp.

#### 1.2.2 Doe Run Meteorological Sites

Doe Run Herculaneum also operates one ten meter tower meteorological monitoring site as per language set forth under the 2011 Consent Judgment. Doe Run Herculaneum discontinued the 40 meter tower at Broad Street as per the Consent Judgment.

#### 1.3 Department's Lead Monitoring Network in Herculaneum

With the cessation of operation of emission units at the Doe Run facility in Herculaneum, the department will carefully evaluate the lead data monitored at its sites in Herculaneum and may consider modification, particularly sampling schedules at the Mott site.

#### 1.4 St. Joe State Park Monitoring Site

The department proposes to discontinue the Special Purpose lead monitoring site at St. Joe State Park. The St. Joe State Park site was intended to monitor airborne lead concentrations during remediation activities involving old lead mining waste in the Federal Mine Tailings. The remediation activity has since been completed as of late July/early August of 2014. The three-month rolling average has not exceeded the lead standard, 0.15  $\mu\text{g}/\text{m}^3$  since the site began monitoring lead on July 1, 2010. The highest three-month rolling average airborne lead concentration at that site was 0.141  $\mu\text{g}/\text{m}^3$  in July-September 2011. These elevated lead concentrations were attributable to remediation activities near the monitor. Since that time the lead concentration at that site has not exceeded 0.134  $\mu\text{g}/\text{m}^3$ .

#### 1.5 Blair Street TSP Lead Monitor

The department proposes to discontinue the TSP Lead Monitor at the Blair Street NCore site in St. Louis pending approval of revisions to Ambient Monitoring Quality Assurance and other requirements, 40 CFR 58.

### **2. Sulfur Dioxide Monitoring Network**

On June 2, 2010, the US EPA revised the primary sulfur dioxide (SO<sub>2</sub>) standard by establishing a 1-hour standard at the level of 75 parts per billion (ppb). The EPA revoked the two previous primary standards of 140 ppb evaluated over 24-hrs and 30 ppb evaluated over an entire year. The 2011 Monitoring Network Plan<sup>1</sup> identified the minimum network monitoring required by the Population Weighted Emissions Index (PWEI). This analysis has been updated using 2010 census data and 2011 NEI emissions. The required numbers of monitoring sites based on the PWEI (2 sites each in the St. Louis and Kansas City CBSAs) did not change.

On April 17, 2014, US EPA issued proposed data requirements regulations related to SO<sub>2</sub> air quality monitoring and air quality dispersion modeling near emission sources. These proposed regulations were published in the Federal Register on May 13, 2014, but have not yet been finalized. Once finalized, they will require either modeling or monitoring to adequately

<sup>1</sup> <http://dnr.mo.gov/env/apcp/docs/2011monitoringnetwork.pdf>

characterize ambient SO<sub>2</sub> concentrations near emission sources larger than a designated size; monitoring pursuant to these regulations will be required to begin in January 2017. The department's current SO<sub>2</sub> network will be modified as necessary to be consistent with the SO<sub>2</sub> Data Requirements Final Rule (DRR). The department has indicated if a source chooses to monitor, versus modeling, that the source is responsible for the cost of the monitor. However, the department will review, and approve the siting of the monitor(s) based on federal regulations and oversee the operation of the monitors. Currently, since the DRR is not final and the monitoring requirements are still draft, any monitors sited for SO<sub>2</sub> are considered Special Purpose Monitors. Once the rule is finalized, it is the intention to convert these monitors to SLAMS. In order to utilize the data for NAAQS compliance, the monitors will need a minimum of three years of monitoring data and the source cannot discontinue the monitor without prior approval from the department.

### 2.1 Special Purpose Industrial SO<sub>2</sub> & Meteorological Monitoring near the Labadie Energy Center

The department's current SO<sub>2</sub> monitoring network (Figure 2.1) was modified to add two special purpose SO<sub>2</sub> ambient air monitoring sites and two meteorological monitoring stations in an area around the Ameren UE Labadie Energy Center, located at 226 Labadie Power Plant Road in Franklin, County, MO. These monitoring sites (see the following table) are operated by Ameren UE under a department-approved Quality Assurance Project Plan (QAPP).

#### Summary of New Special Purpose Monitoring Stations (SPM):

Monitoring Objective: Source Oriented

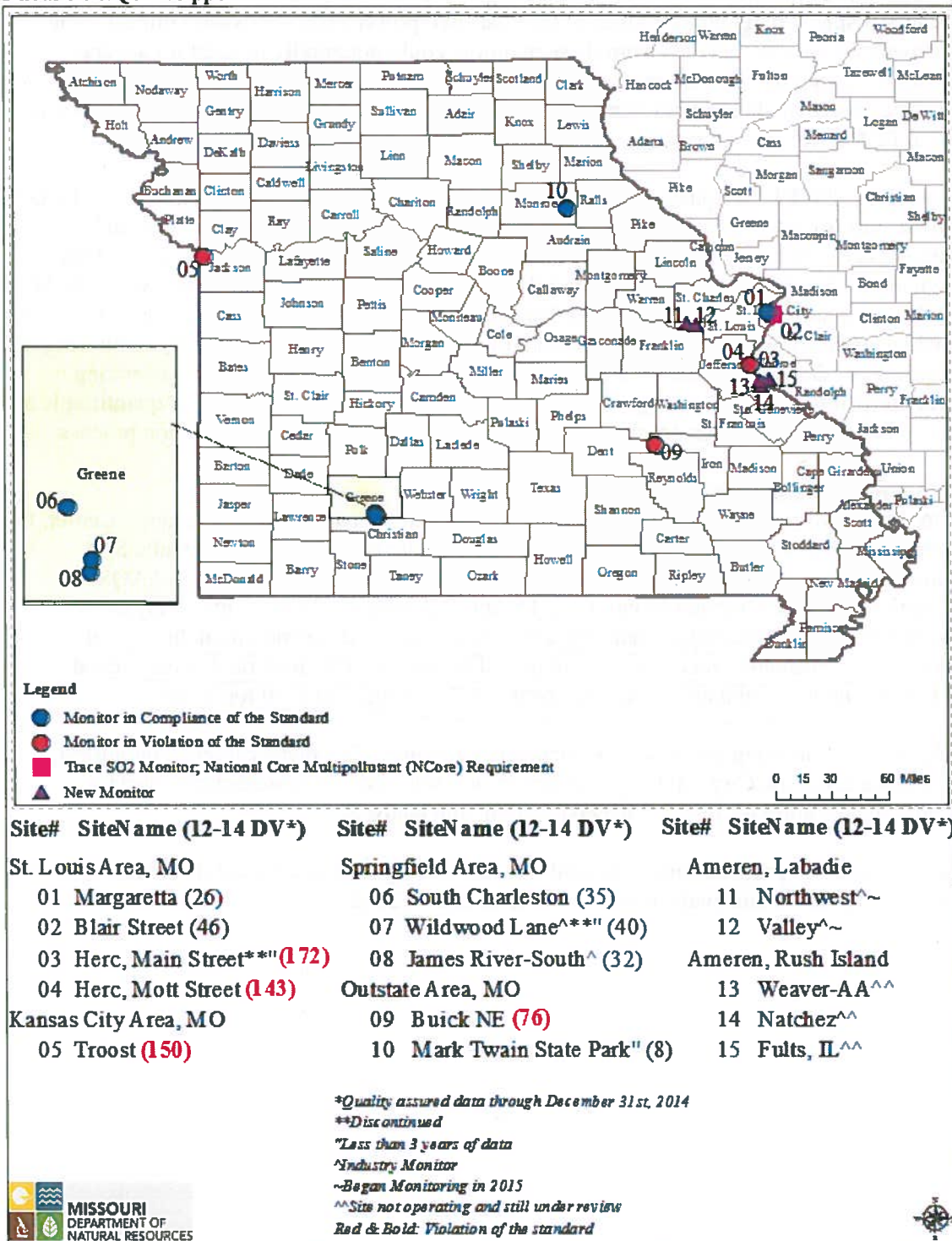
Spatial Scale of representativeness: Middle Scale (100m<sup>2</sup> to 0.5 km<sup>2</sup>)

Labadie Northwest -SO<sub>2</sub>. (Lat: 38.5818 Long: -90.865528)

Labadie Valley NE -SO<sub>2</sub>, 10 Meter Meteorological Station (Lat: 38.572522 Long: -90.796911)

Labadie Osage Ridge -Meteorological Station only, anemometers at 56.4 and 90 m levels (Lat: 38.60586 Long: -90.9362)

**Figure 2.1. Missouri Statewide SO<sub>2</sub> Monitoring Network, 2015**  
 1-hour NAAQS = 75 ppb



In July 2012 the department and Ameren UE technical staff began discussing a potential SO<sub>2</sub> ambient air monitoring project to characterize areas of anticipated 1-hour SO<sub>2</sub> ground level impact from the Labadie Energy Center and to collect meteorological data suitable for use in regulatory dispersion modeling studies of the coal fired power plant's emission impact. The department anticipated that data from these monitors could potentially be used for several purposes including use in a future EPA rulemaking described as the SO<sub>2</sub> Data Requirements Rule. The proposed Data Requirements Rule and SO<sub>2</sub> implementation strategy is discussed in detail at EPA's website: <http://www.epa.gov/oaqps001/sulfurdioxide/implement.html>

On March 20, 2015 EPA updated implementation guidance as a result of the March 2, 2015 U.S. District Court for the Northern District of California accepting an enforceable order and agreement between the EPA and Sierra Club and Natural Resources Defense council. This agreement is intended to resolve litigation related to the deadline for completing the 1-hour SO<sub>2</sub> NAAQS designations process. Although this agreement and subsequent change in EPA's implementation strategy may limit the potential future use of quality assured SO<sub>2</sub> monitoring and meteorological data in this area for some purposes, the department believes characterizing current air quality and meteorology near the Labadie Energy Center will provide quantifiable and useful information to supplement the ongoing 1-hour SO<sub>2</sub> NAAQS implementation process.

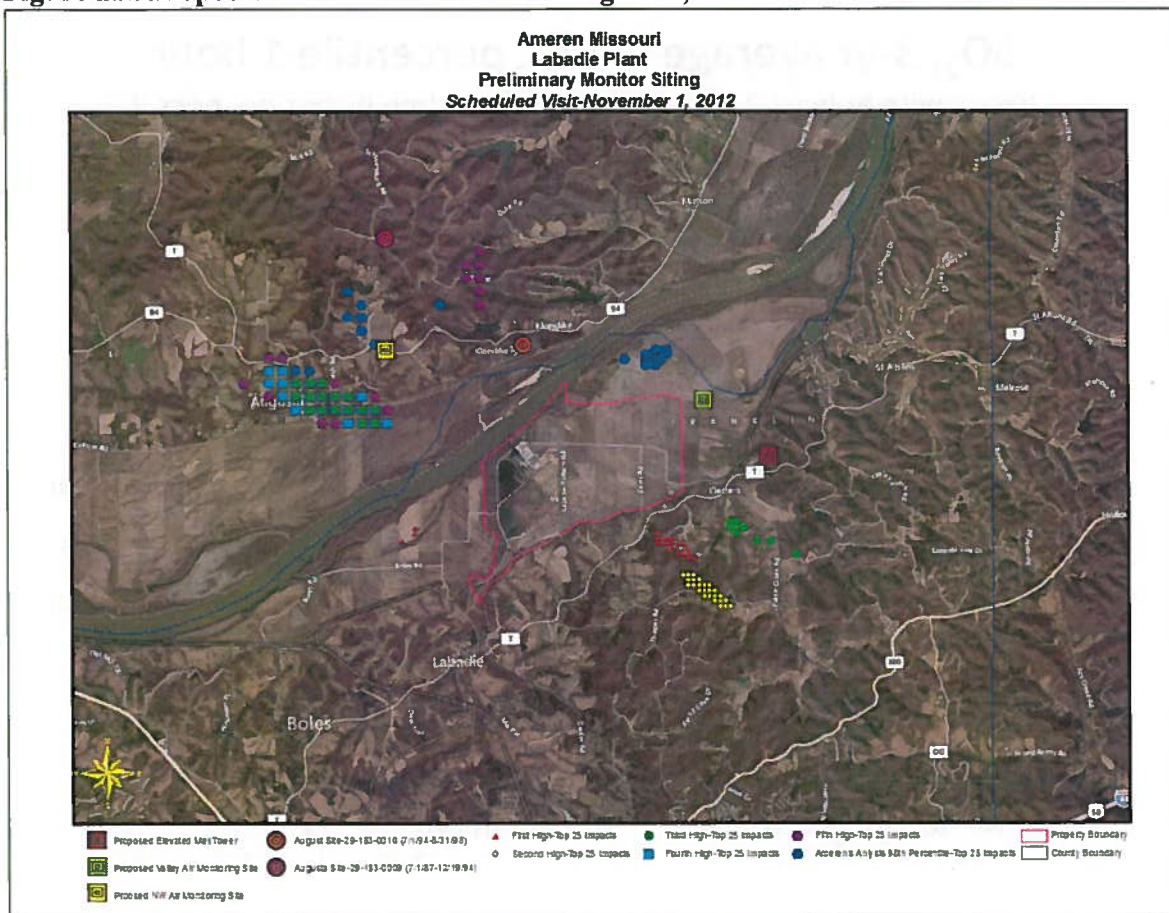
#### 2.1.1 Analysis and Site Section - Labadie

Due to the lack of recent on-site or nearby meteorological data at the Labadie Energy Center, the department used a weight of evidence approach to evaluate the siting of the Labadie SO<sub>2</sub> monitors and meteorological stations following guidance in the draft EPA SO<sub>2</sub> NAAQS Designations, Source-Oriented Monitoring, Technical Assistance Document (TAD) Draft December 2013. This evaluation included a review of relative dispersion modeling, local meteorological evaluation methodology submitted by Ameren UE, historical departmental SLAMS SO<sub>2</sub> monitoring data, nearby meteorological stations, and local topography.

As identified in the siting methodology document (Appendix 2) a meteorological monitoring station at the Jefferson City, MO regional airport was selected as a representative surface meteorological station for relative dispersion modeling analysis.

Figure 2.2 plots the proposed and historical SO<sub>2</sub> monitoring sites against the dispersion modeling output used for an on-site evaluation trip on November 1, 2012.

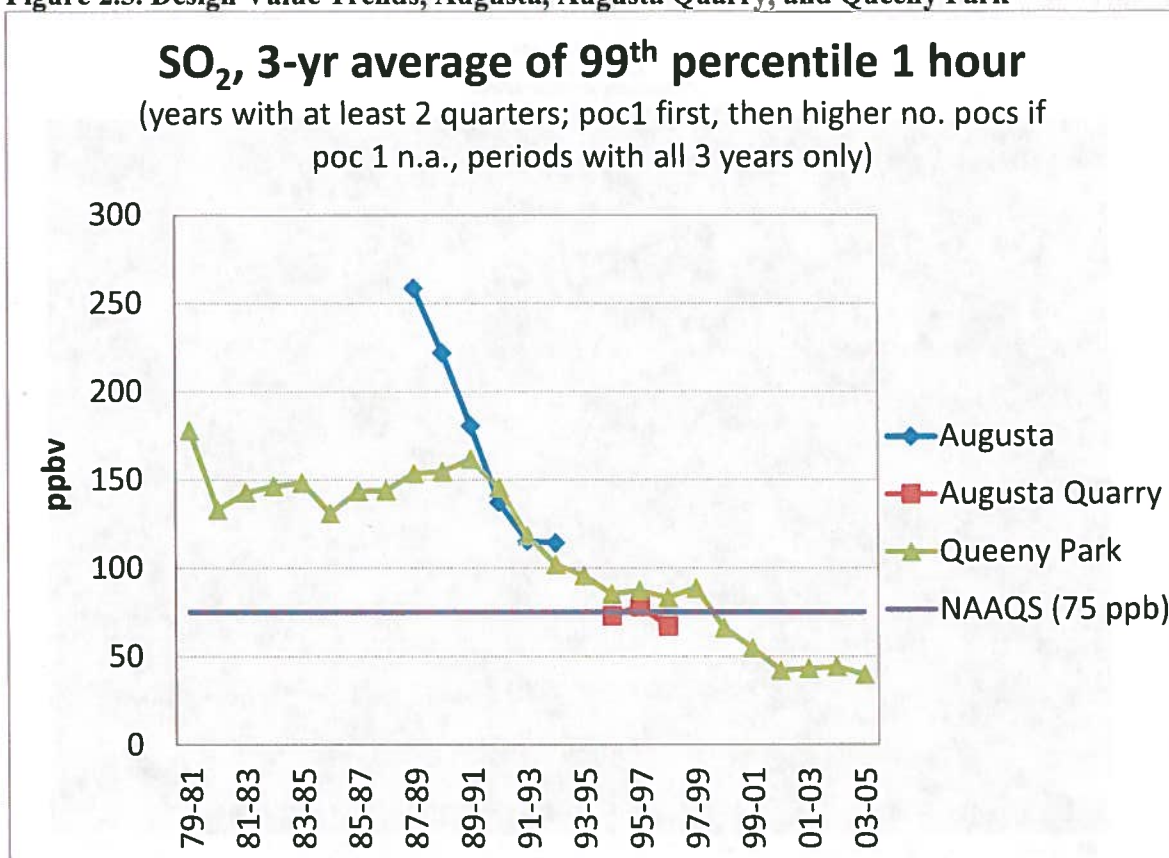
**Figure 2.2. Proposed and Historical Monitoring Sites, 2012**



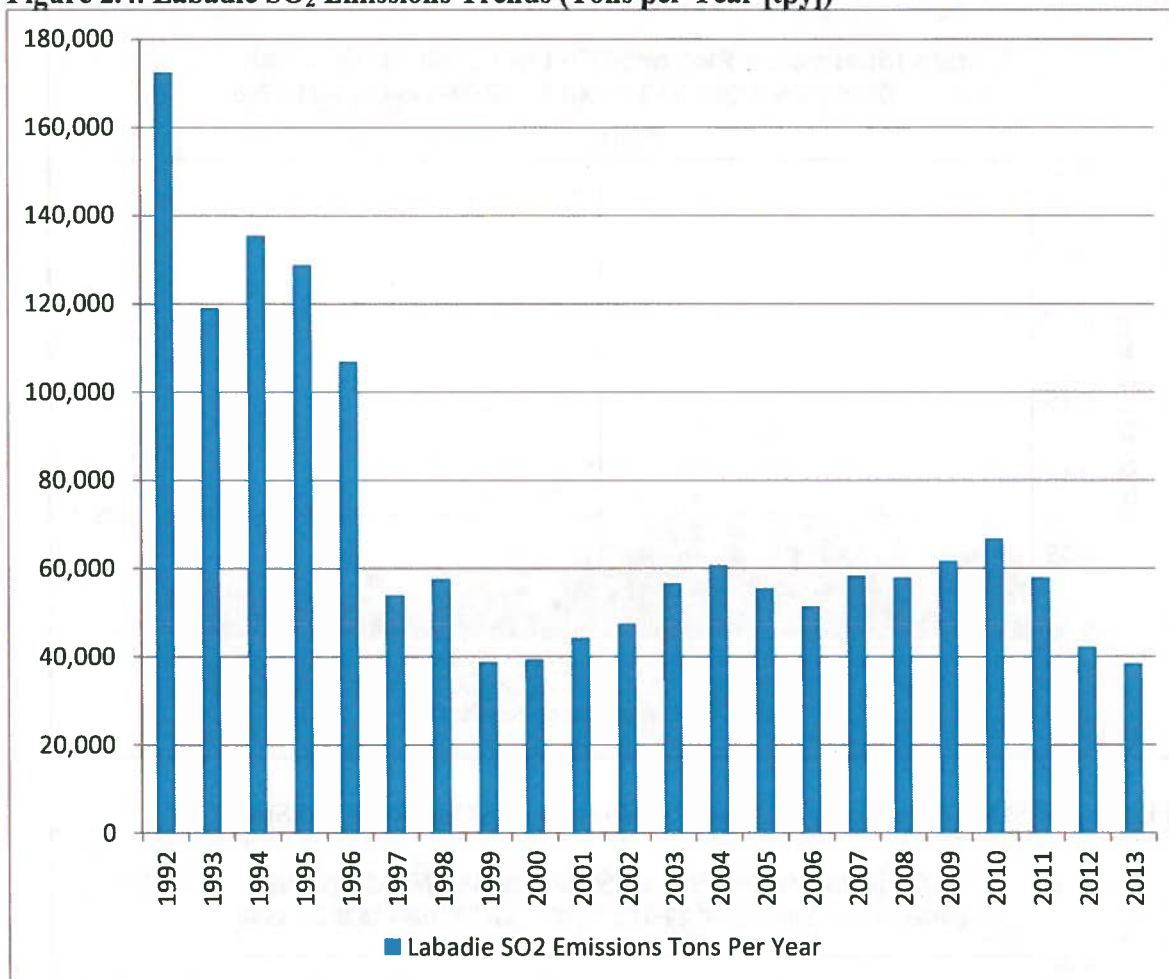
The former MDNR ambient air monitoring sites known as Augusta (AQS #29-183-0009) and Augusta Quarry (AQS # 29-183-0010) were in operation from 1987-1994 and 1994-1998, respectively but subsequently discontinued due to relatively low monitored concentrations as compared to the previous SO<sub>2</sub> NAAQS; their continued operation was no longer required by NAAQS compliance monitoring rules in place at that time. Although these former monitoring sites show a history of monitoring exceedances of the current 1-hour SO<sub>2</sub> NAAQS, the frequency of exceedances at the Augusta Quarry site was relatively low; only about 22 1-hour SO<sub>2</sub> exceedances were monitored between 1994 and 1998. Some of these exceedances occurred on the same day, which suggests that this site may not have been located in an area expected to monitor frequent high 1-hour SO<sub>2</sub> concentrations.

Changes in 1-hour SO<sub>2</sub> design value trends over the period indicate that these sites were monitoring steep declines in 1-hour SO<sub>2</sub> concentrations (Figure 2.3) which was likely due to significant emissions reductions at the Labadie Energy Center. See the SO<sub>2</sub> emission trends in Figure 2.4. For reference, the Queeny Park site (AQS# 29-189-0006, 305 WEIDMAN ROAD) is not depicted in Figure 2.2 but was located approximately 30 km east-northeast of the Labadie Energy Center in St. Louis County and also monitored generally decreasing concentration trends over the same period.

Figure 2.3. Design Value Trends, Augusta, Augusta Quarry, and Queeny Park



**Figure 2.4. Labadie SO<sub>2</sub> Emissions Trends (Tons per Year [tpy])**



In addition to SO<sub>2</sub> monitoring, the Augusta Quarry site had an on-site meteorological station monitoring wind speed and wind direction at a height of approximately 7 meters above ground level. However, this station was intended for culpability analysis and not of sufficient quality to be used for regulatory dispersion modeling consistent with the requirements of 40 CFR 51 Appendix W. Despite the limitations of this historical meteorological data, department staff annualized the data set for monitored SO<sub>2</sub> concentration trends by wind speed and wind direction to compare to more recent area meteorological data obtained from EPA's AirNowTech system and Ameren UE's monitor siting methodology document.

Figure 2.5 depicts hourly SO<sub>2</sub> concentrations vs. the on-site wind direction. 0 or 360 degrees indicates winds are blowing from the north, 180 degrees indicates winds blowing from the south, 270 winds blowing from the West, 90 winds blowing from the east. The Labadie Energy center is located approximately south-southwest of the former Augusta Quarry site. Figure 2.6 shows hourly SO<sub>2</sub> concentrations vs. wind speed for the same period.

Figure 2.5. SO<sub>2</sub> Concentration Trends by Hour vs. the On-Site Wind Direction

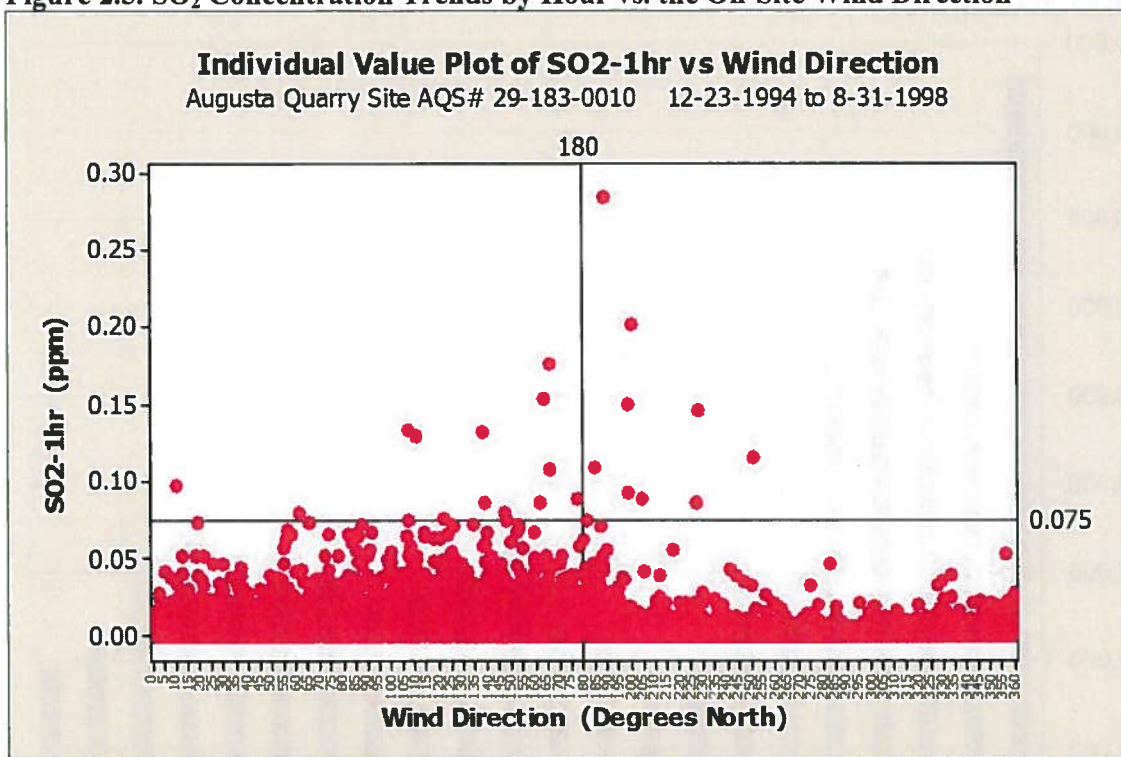


Figure 2.6. SO<sub>2</sub> Concentration Trends by Hour vs. the On-Site Wind Speed

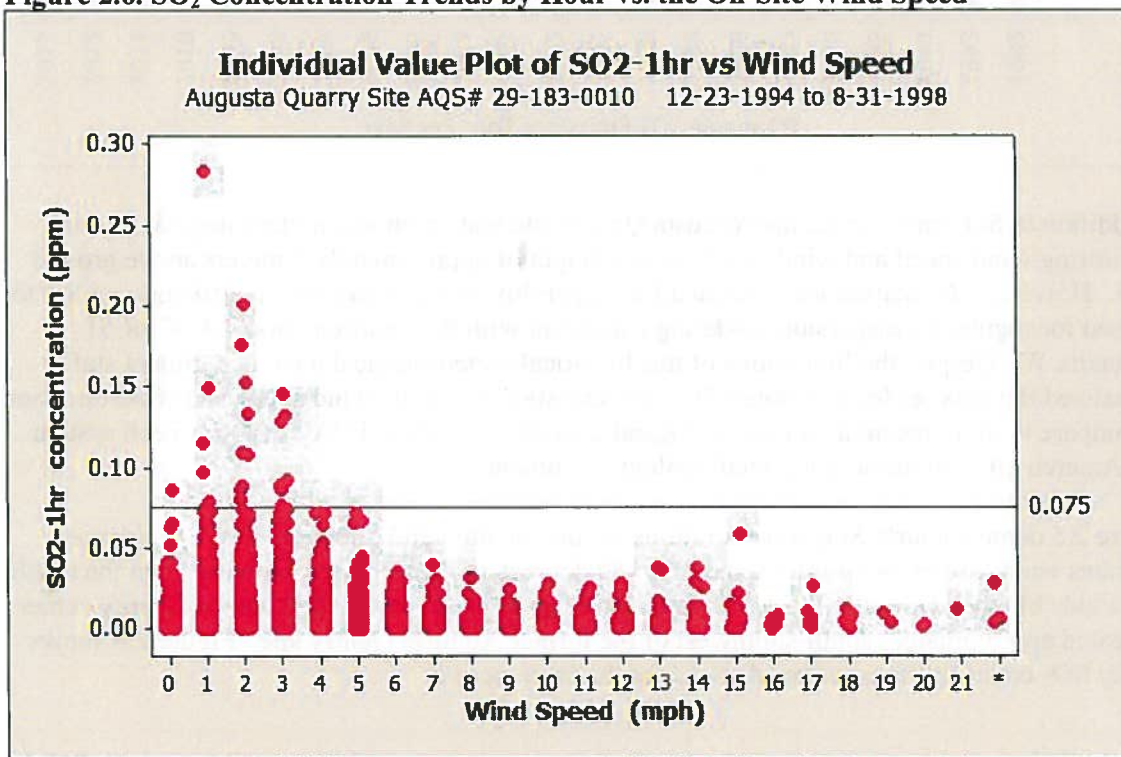


Figure 2.7 shows frequency of wind direction at the Augusta Quarry site. Site evaluation and photographic records for this site indicate that there was a stand of trees to the southeast of the monitoring site which may explain the low frequency in wind direction from the 50 to 150 degree sector of wind rose. The frequency of winds from 0 to 50 degrees tends to indicate river valley influence since the site was oriented on the bluff where the river valley runs northeast to southwest. However, due to the nearby trees and the low elevation of this anemometer (about 7 meters above ground level) the department cautions use of this data for some purposes. However, it does provide another piece of evidence that local meteorology in this area is complex.

**Figure 2.7. Former Augusta Quarry Frequency of Wind Direction by Degrees Compass (Degrees from North).**

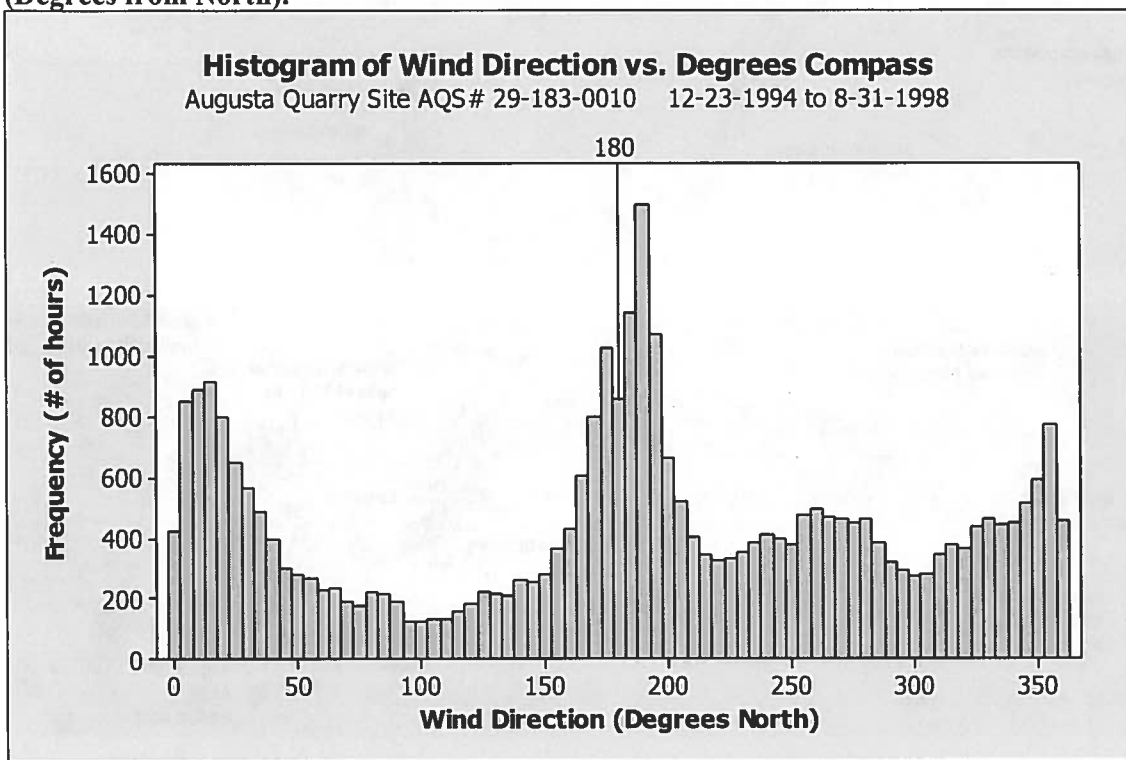
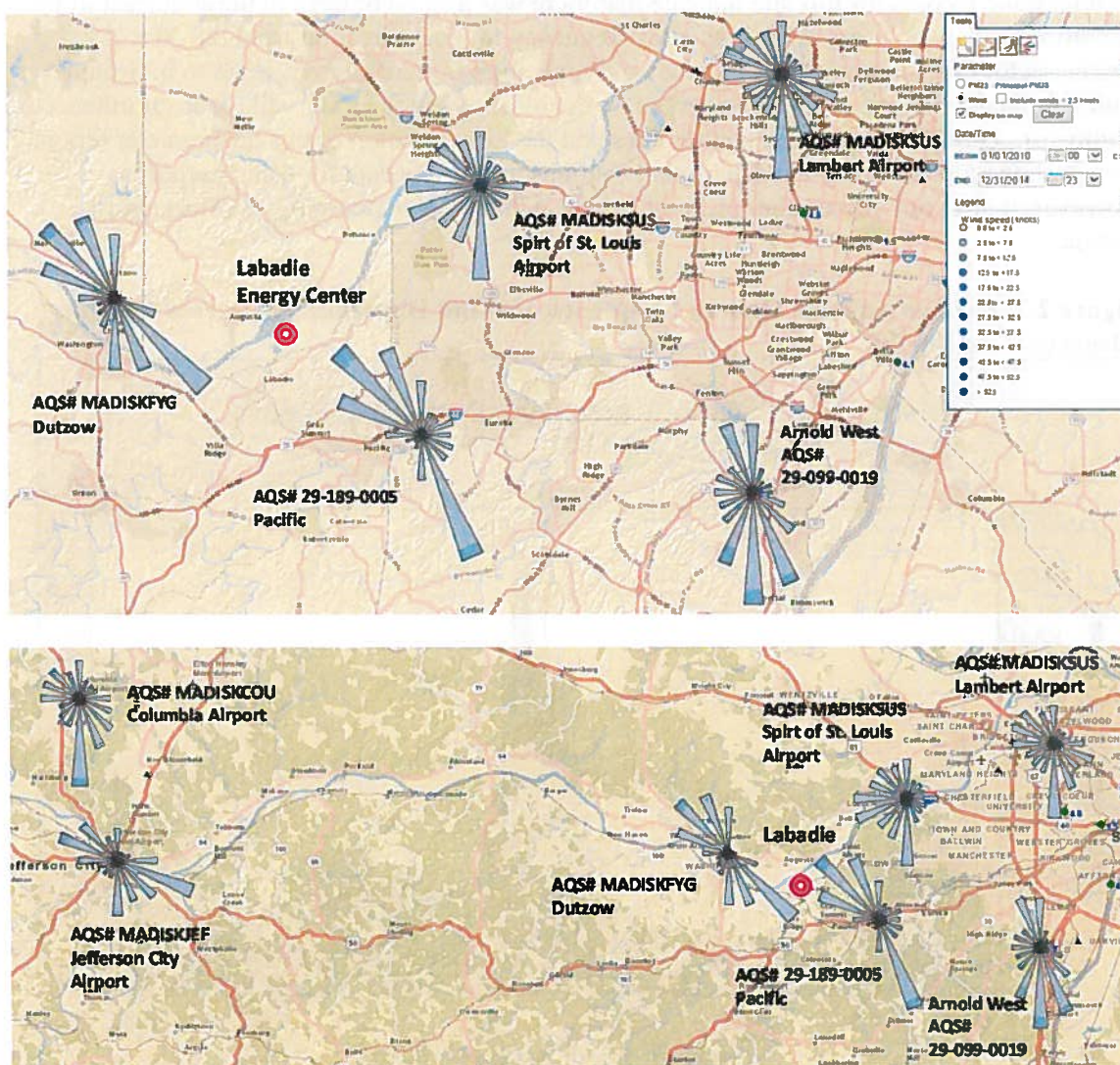


Figure 2.8 shows wind rose plots for other area meteorological stations reporting data to EPA's AirNowTech system (2010-2014). Several weather stations in the plot have predominant wind directions from the southeast: Pacific (AQS # 29-189-0005), Jefferson City (MADIS-KJEF), and MADIS (MADISKFYG) near Dutzow MO. This result tends to indicate that, in the absence of strong synoptic forcing, the river valley will tend to influence local wind flow.

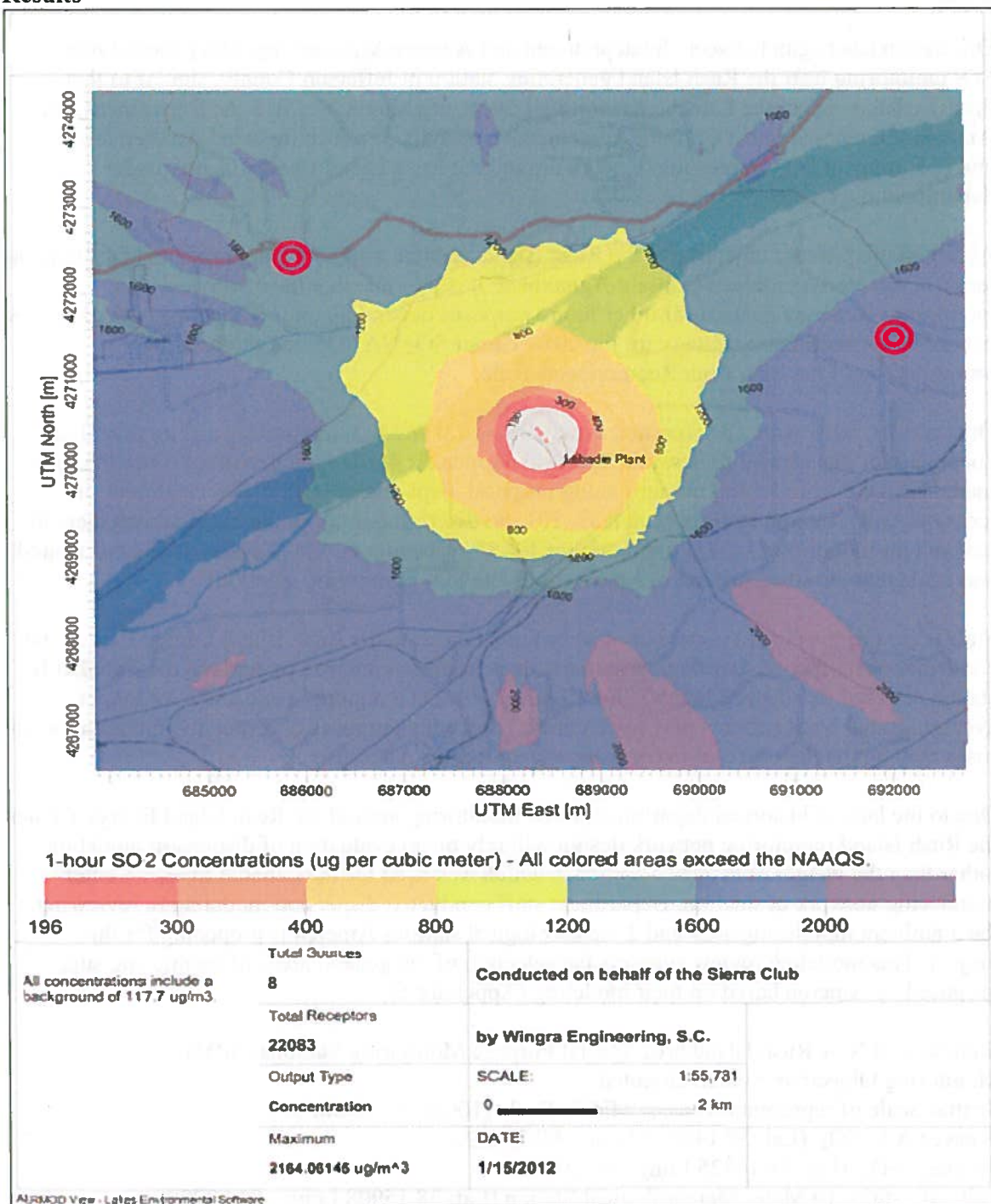
Figure 2.8. Wind Rose Plots Surrounding Labadie



Department staff also evaluated dispersion modeling by the Sierra Club submitted as comments to the department's 2014 Monitoring Network Plan. The Sierra Club's dispersion modeling reportedly used the Spirit of St. Louis Airport surface meteorological station (located approximately 22 miles northeast of the Labadie Energy Center) for the surface meteorological data input.

Figure 2.9 shows the approximate location of proposed Labadie SO<sub>2</sub> Monitoring sites relative to Sierra Club modeling submitted as public comments to the MO 2014 Monitoring Network Plan. The Labadie Valley (NE) site is superimposed on the purple shaded region, suggesting that if this modeling is representative of the area one of the proposed monitoring sites is located in an area of anticipated high SO<sub>2</sub> concentrations.

**Figure 2.9: Proposed Labadie Monitoring Locations Relative to Sierra Club Modeling Results**



## 2.2 Special Purpose Industrial SO<sub>2</sub> & Meteorological Monitoring near the Rush Island Energy Center

Discussion has begun between the department and Ameren Missouri regarding special purpose SO<sub>2</sub> monitoring near the Rush Island generating station in Jefferson County, similar to that discussed above near the Labadie generating station. On March 23, 2015 the Department and Ameren UE entered into a Consent Agreement (Appendix 3) which included Ameren installing and operating an SO<sub>2</sub> monitoring network around the Rush Island Energy Center under department oversight.

Although the primary objective of the Rush Island ambient air monitoring project is to satisfy the terms of the aforementioned Consent Agreement, it is possible that the quality assured monitoring data may be used for other future purposes depending on the final outcome of EPA's national implementation strategy for the 2010 1-hour SO<sub>2</sub> NAAQS and the pending promulgation of the EPA Data Requirements Rule.

On April 29, 2015 Ameren submitted a meteorological and SO<sub>2</sub> monitoring site methodology document for department review and approval (Appendix 4). In anticipation of receiving the methodology document and monitor siting proposal, department staff visited candidate site locations with Ameren staff on March 31, 2015 to determine if the candidate locations meet the ambient air monitoring siting criteria of 40 CFR 58 Appendix E. On May 20, 2015 staff visited and evaluated the siting criteria of a third candidate SO<sub>2</sub> monitoring location.

Staff reviewed the closest meteorological stations closest to the Rush Island Energy Center and confirmed that other meteorological stations show similar wind rose patterns as the Cahokia IL station selected for dispersion modeling (figure 2.10). On a regional scale and over longer averaging time wind patterns may look similar but for the purposes of dispersion modeling wind roses may not be the best tool to compare meteorological patterns.

Due to the lack of historical departmental SO<sub>2</sub> monitoring around the Rush Island Energy Center, the Rush Island monitoring network design will rely on an evaluation of dispersion modeling rather than the weight of evidence approach which was used for the Labadie Energy Center monitoring network evaluation. Department staff conducted dispersion modeling in reviewing the 3 ambient monitoring sites and 2 meteorological stations Ameren is proposing for this project. This modeling review supports the selection of the general areas of monitoring sites proposed by Ameren based on their modeling (Appendix 5).

Summary of New Rush Island area Special Purpose Monitoring Stations (SPM):

Monitoring Objective: Source Oriented

Spatial Scale of representativeness: Middle Scale (100m<sup>2</sup> to 0.5 km<sup>2</sup>)

Weaver-AA -SO<sub>2</sub>. (Lat: 38.144529 Long: -90.304726)

Natchez -SO<sub>2</sub>, (Lat: 38.10525 Long: -90.29842)

Fults, IL, -SO<sub>2</sub>, 10 Meter Meteorological Station (Lat: 38.15908 Long: -90.22728)

Rush Tall Tower -Meteorological Station Only, anemometers at 60m and 90m levels (Lat: 38.11999 Long: -90.28214)

[illegible]

